

What is claimed is:

1. A method for stimulating perfusion, comprising the steps of:
selecting a patient having a tissue with compromised microvascular perfusion;
applying an ultrasound transducer to a location near the tissue; and
5 activating the transducer to initiate exposure of the tissue to ultrasound at a
frequency of 100 KHz to 2.0 MHz for a duration of 0.5 to 15 minutes, wherein local
vasodilatation is stimulated.
2. The method of claim 1, further comprising the step of confirming that local
vasodilatation is stimulated, by measuring an enhancement in perfusion.
- 10 3. The method of claim 1, wherein the transducer is activated to initiate exposure to
ultrasound at a frequency of 100 KHz to 1.0 MHz.
4. The method of claim 1, wherein the transducer is activated to initiate exposure to
ultrasound at a frequency of 100 KHz to 200 KHz.
5. The method of claim 1, wherein the duration of exposure is 0.5 to 10 minutes.
- 15 6. The method of claim 1, wherein the duration of exposure is 5 to 10 minutes.
7. The method of claim 1, wherein the transducer is activated to initiate exposure to
ultrasound with a temporal and spatial average energy level of 0.01 to 1.00 watts/cm².
8. The method of claim 1, wherein the transducer is activated to initiate exposure to
ultrasound with pulsed modulation.

9. The method of claim 1, wherein the transducer is activated to initiate exposure to ultrasound with non-pulsed modulation

10. A method for stimulating reperfusion in a patient having a tissue experiencing an ischemic injury, comprising the steps of:

- 5 selecting a patient experiencing a myocardial infarction;
- applying a portable transcutaneous ultrasound transducer within 30 minutes after the ischemic injury to a location near the tissue at the site of the ischemic injury;
- activating the transducer to initiate exposure of the tissue to ultrasound and thereby stimulate local vasodilatation; and
- 10 confirming the establishment of reperfusion.

11. The method of claim 10, further comprising the steps of applying a gel to enhance the transmission of ultrasound waves.

12. The method of claim 10, further comprising the steps of adjusting the focal length of the ultrasound waves.

15 13. The method of claim 10, wherein the frequency of the ultrasound waves is 100 KHz to 2.0 MHz.

14. The method of claim 10, wherein the ultrasound exposure is maintained for 15 minutes.

15. The method of claim 10, wherein the step of confirming the establishment of
20 reperfusion comprises a procedure selected from the group consisting of angiography, electrocardiogram, diagnostic ultrasound, and measuring blood levels of creatine kinase.

16. The method of claim 10, further comprising the steps of injecting an anticlotting agent into the patient.

17. The method of claim 16, wherein the anticlotting agent is selected from the group consisting of aspirin, tissue plasminogen activator, and streptokinase.

5 18. A method for stimulating myocardial perfusion, comprising the steps of:
selecting a patient having a myocardium with compromised perfusion;
applying an ultrasound transducer to a location near the myocardium; and
activating the transducer to initiate exposure of the myocardium to ultrasound at a
frequency of 100 KHz to 2.5 MHz, wherein myocardial blood flow is enhanced.

10 19. The method of claim 18, further comprising the step of confirming enhancement
in myocardial blood flow.

20. The method of claim 18, wherein the transducer is activated to initiate exposure to
ultrasound at a frequency of 100 KHz to 1.0 MHz.

21. The method of claim 18, wherein the transducer is activated to initiate exposure to
15 ultrasound at a frequency of 100 KHz to 200 KHz.

22. The method of claim 18, wherein the exposure to ultrasound is for a duration of
exposure is 0.5 to 15 minutes.

23. The method of claim 18, wherein the exposure to ultrasound is for a duration of
exposure is 0.5 to 10 minutes.

24. The method of claim 18, wherein the exposure to ultrasound is for a duration of exposure is 5 to 10 minutes.

25. The method of claim 18, wherein the transducer is activated to initiate exposure to ultrasound with a temporal and spatial average energy level of 0.01 to 1.00 watts/cm².

5 26. The method of claim 18, wherein the transducer is activated to initiate exposure to ultrasound with pulsed modulation.

27. The method of claim 18, wherein the transducer is activated to initiate exposure to ultrasound with non-pulsed modulation.

28. A method for stimulating cerebral perfusion, comprising the steps of:
10 selecting a patient having a cerebral tissue with compromised perfusion;
applying an ultrasound transducer to a location near the head; and
activating the transducer to initiate exposure of the head to ultrasound at a
frequency of 100 KHz to 2.5 MHz, wherein cerebral blood flow is enhanced.

29. The method of claim 28, further comprising the step of confirming enhancement
15 in cerebral blood flow.

30. The method of claim 28, wherein the transducer is activated to initiate exposure to ultrasound at a frequency of 100 KHz to 1.0 MHz.

31. The method of claim 28, wherein the transducer is activated to initiate exposure to ultrasound at a frequency of 100 KHz to 200 KHz.

32. The method of claim 28, wherein the exposure to ultrasound is for a duration of exposure is 0.5 to 15 minutes.

33. The method of claim 28, wherein the exposure to ultrasound is for a duration of exposure is 0.5 to 10 minutes.

5 34. The method of claim 28, wherein the exposure to ultrasound is for a duration of exposure is 5 to 10 minutes.

35. The method of claim 28, wherein the transducer is activated to initiate exposure to ultrasound with a temporal and spatial average energy level of 0.01 to 1.00 watts/cm².

10 36. The method of claim 28, wherein the transducer is activated to initiate exposure to ultrasound with pulsed modulation.

37. The method of claim 28, wherein the transducer is activated to initiate exposure to ultrasound with non-pulsed modulation.

38. A method for stimulating perfusion in a transplanted tissue, comprising the steps of:

15 selecting a patient having a transplanted tissue;
applying an ultrasound transducer to a location near the transplanted tissue; and
activating the transducer to initiate exposure of the transplanted tissue to
ultrasound at a frequency of 100 KHz to 2.0 MHz for a duration of 0.5 to 15 minutes, wherein
local vasodilatation is stimulated.

39. The method of claim 38, further comprising the step of confirming that local vasodilatation is stimulated, by measuring an enhancement in perfusion.

40. The method of claim 38, wherein the transplanted tissue is from a skin transplant.

41. The method of claim 38, wherein the transplanted tissue is from a lung transplant.

5 42. The method of claim 38, wherein the transplanted tissue is from a heart transplant.

43. The method of claim 38, wherein the transplanted tissue is from a liver transplant.

44. The method of claim 38, wherein the transplanted tissue is from a kidney transplant.

45. The method of claim 38, wherein the transducer is activated to initiate exposure to
10 ultrasound at a frequency of 100 KHz to 1.0 MHz.

46. The method of claim 38, wherein the transducer is activated to initiate exposure to ultrasound at a frequency of 100 KHz to 200 KHz.

47. The method of claim 38, wherein the exposure to ultrasound is for a duration of exposure is 0.5 to 10 minutes.

15 48. The method of claim 38, wherein the exposure to ultrasound is for a duration of exposure is 5 to 10 minutes.

49. The method of claim 38, wherein the transducer is activated to initiate exposure to ultrasound with a temporal and spatial average energy level of 0.01 to 1.00 watts/cm².

50. The method of claim 38, wherein the transducer is activated to initiate exposure to ultrasound with pulsed modulation.

51. The method of claim 38, wherein the transducer is activated to initiate exposure to ultrasound with non-pulsed modulation.